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(71) Applicant
Thorn EMI Domestic Appliances Limited (United Kingdom),
Thorn EMI House, Upper Saint Martins Lane, London WC2H 9ED

(72) Inventors
Pathmanathan Jeganathan
Kenneth George Smith

(74) Agent and/or Address for Service
I A Fleming,
Thorn EMI Patents Limited, The Quadrangle,
Westmount Centre, Uxbridge Road, Hayes, Middlesex UB4 0HB

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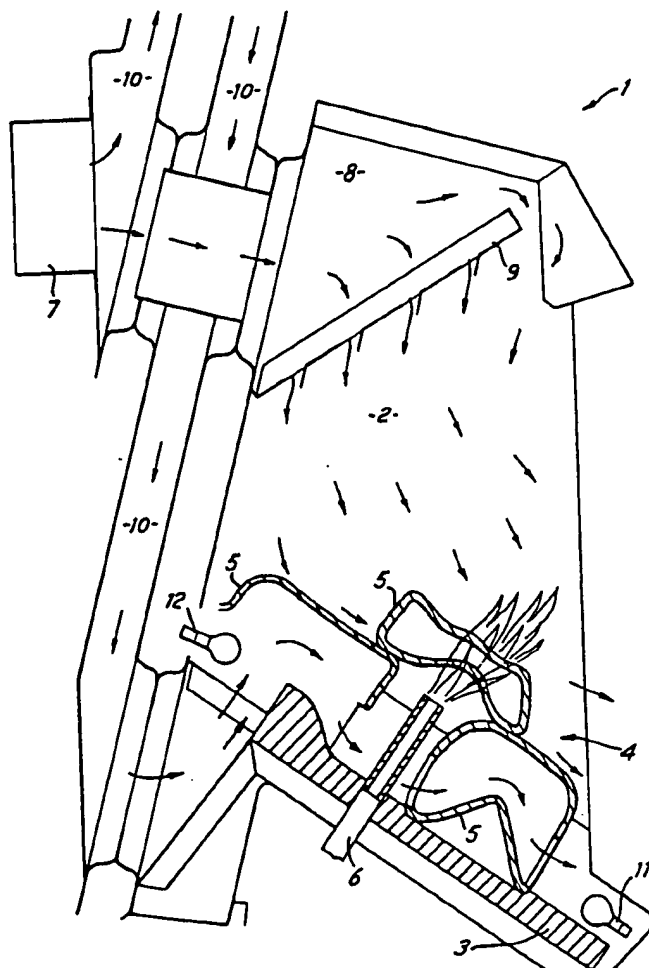
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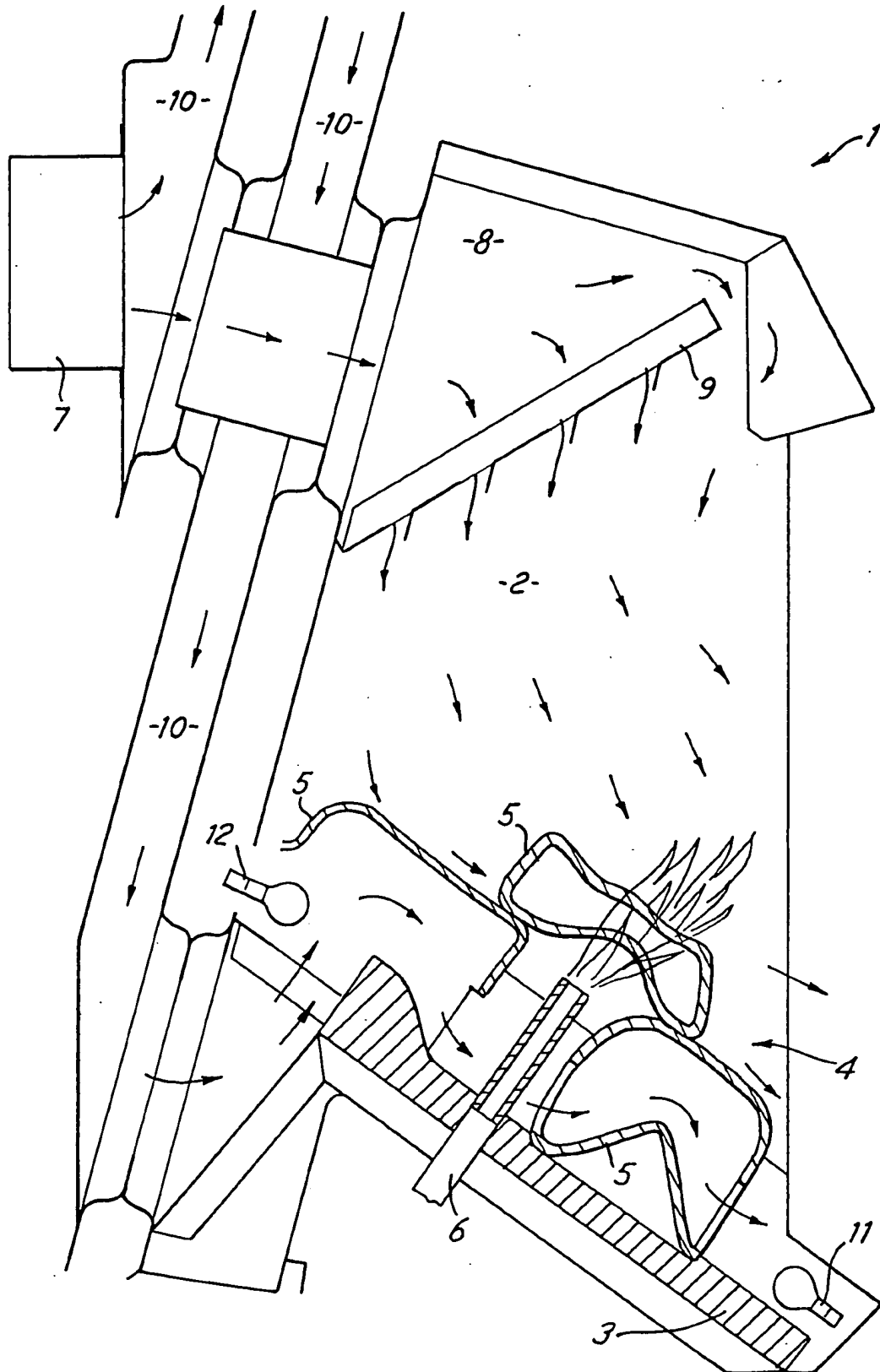
(54) Simulated solid fuel gas fires

(57) A gas appliance includes a burner (6) for directing a flame around and over simulated solid fuel (5) in the form of coals. A fan (7) is used to establish a current of air in the top portion (8) of chamber (2) and a grille (9) guides the air current in a downwards direction onto the flame. The flame is thus caused to move randomly and simulates flame movement produced when the fire is being used in a heating mode. An air current may also or alternatively be directed substantially laterally across the flame.



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SPECIFICATION

Gas appliance

- 5 The present invention relates to a gas appliance, particularly but not exclusively a gas fire, which appliance simulates a real solid-fuel fire.

- At present, gas fires which simulate real
10 solid-fuel fires form a significant portion of the total gas fire market and much effort is expended in attempting to improve their appearance so that they simulate real solid-fuel fires better. However, whereas many types of simulation fires have a pleasing and comparatively realistic appearance when in operation, none looks very attractive or convincing when turned off. Thus, as most gas fire showrooms have little, if any flueing suitable for operating
20 the fires on display, a potential customer is not able to make a comparison of the appearance of all the fires when turned on.

- An object of the present invention is to provide a gas appliance which can be safely
25 used for display without requiring flueing.

- The present invention provides a gas appliance for simulating a solid-fuel fire, the appliance comprising simulated solid fuel, at least one burner positioned to project a flame
30 around and over the simulated solid fuel, and means to urge a stream of air to the vicinity of the flame or flames to produce fluctuation thereof.

- Thus any flames around the simulated fuel
35 have a continually varying, dancing shape thereby providing a realistic appearance. Such movement can only be achieved in conventional gas fires when in the heating mode, in which case the hot gases form turbulence resulting in the fluctuations of those flames
40 around the simulated fuel; as these fires are operating in the heating mode, then suitable flueing must be provided. However, in the invention, the flame movement can be achieved without the fire being in a heating mode, thereby obviating any necessity of flueing.

- Also, in the invention the forced air stream dilutes these combustion products resulting
50 from the flames around the simulated fuel, thereby further ensuring that these products are harmless.

- The gas appliance may have any suitable urging means; in a preferred form the urging means is a fan. The urging means is preferably positioned to direct the resultant air stream, with the aid of suitable guiding means, downwardly onto the vicinity of the flame or flames. Additionally or alternatively
60 the resultant air stream is directed, in use of the appliance, around a burner in a direction substantially perpendicular to the direction of gas flow from the burner.

- The gas appliance may include means to
65 illuminate the simulated solid fuel to produce

the appearance of glowing solid fuel. In this way the realistic appearance of the appliance is further enhanced. The illumination means may be one or more lights, whether filament or gas discharge lights or a combination of each, and they may be positioned in any suitable way, for example below and to the front of the simulated fuel.

- In one application of the present invention,
75 a particular example of one model of gas fire is modified to enable it to be on display, in operation, at a showroom or exhibition without any flueing being necessary. Thus, in order to adapt one fire, an electrically powered fan (or other suitable urging means) is fitted at the back of the fire such as to force air down the exit conduit(s) and into the region of simulated fuel, this movement being in the opposite direction taken by hot gases in the normal heating mode; also the heater's
80 burners are replaced by lighting directed at the interior of the simulated solid-fuel.

- In another application, a model of gas fire may be designed to have two operating
90 modes, either of which can be selected as required. In one mode, one or more burners provide a heating effect, which also results in fluctuations of the flames produced around the simulated fuel by other burners; in the other mode, there is no heating effect as
95 those burners are switched off, and an electrically-powered fan (or other suitable urging means) causes fluctuations of the flame or flames around the simulated solid-fuel.

- Clearly, such a model of gas fire requires adequate flueing when used in the heating mode; however it has the advantage of providing a realistic simulation of a solid-fuel fire even when no heating effect is desired. A
100 flame ignitor is used to light the burner(s) for the flames around the fuel, and this ignitor can be used also to light the heater burners. The ignitor operates in accordance with a flame sensing device.

- In a further application, a gas appliance is designed to act solely as a display, simulating a real solid-fuel fire, without providing any heating effect at all. Thus the only burners in the appliance are those necessary to provide
115 flames in and around the simulated solid-fuel for display; at least one burner has a flame igniter operable in accordance with a flame-failure sensor. The appliance also has a fan which forces air downwardly onto the exit of the burners to provide fluctuation of the flames.

- In order that the invention may more readily be understood, a description is now given, by way of example only, reference being made to the sole accompanying drawing, partly in
125 cross-section, of a conventional gas fire modified such as to embody the present invention.

- Thus, in the illustrated example a gas fire, of the type having simulated fuel provided
130 with visible fluctuating gas flames, is modified

to enable it to be used in a gas appliance showroom without requiring flueing.

More specifically, a gas fire 1 has an open-fronted combustion chamber 2 and a fire bed 3 formed of a ceramic shaped plate mounted at a shallow angle to the horizontal. On the firebed 3 is mounted the simulated fuel 4 formed by individual refractory elements 5 in the shape of solid fuel, e.g. coals or logs. 10 gas burners 6 (of which only one is shown) are positioned in fire 1 such that their outlets are above firebed 3 and within the simulated fuel 4, thereby resulting in flames which extend around and above the simulated fuel. 15 An electrically-powered fan 7 is fitted to the back of the fire 1 such that it forces two streams of air towards the vicinity of the flames produced by burners 6. The primary air flow passes from fan 7 directly into top chamber 8 and is then guided downwardly by, inter alia, grille 9 onto the simulated fuel 4 and hence the flames. The secondary air flow passes from fan 7, through passages 10 (which form a heat exchanger when the fire is used for heating) and then through the hollow elements 5 forming the simulated fuel 4. The combined effect of these two air flows is to provide substantial turbulence in the region of the burner outlets resulting in fluctuation of the flames. Without such turbulence, the flames from the burner would be substantially static, giving a lifeless, unrealistic imitation of flames which occur in a real solid fuel fire.

The gas flow rate necessary to maintain a flame for display purposes only is very small compared to that rate necessary to provide a heating effect; thus the corresponding low amount of combustion products resultant from display only ensures that gas fire 1 requires 40 no flueing. Also these products are diluted effectively by the forced air stream which mixes with them.

Gas fire 1 has two 25 Watt filament lights 11 positioned at its front and two 25 Watt filament lights 12 positioned at its rear to illuminate the simulated fuel from within, thereby enhancing the illusion that gas fire 1 is operating in its normal heating mode.

Modification of a standard gas fire to the form shown in the Figure and suitable for display without flueing involves the following steps. Firstly fan 7 is assembled on the back of the fire with the fan outlet communicating with the flue outlet of the normal fire. Then 55 those burners, which are arranged on the fire for heating fire bed 3, are removed and replaced by lights 11; also lights 12 are positioned in the fire to illuminate further the interior of the simulated fuel. In the modification, optionally the heat exchanger can be detached from the fire so that neither air flow, in use, passes through it.

Each of the burners 6 may have a valve to permit the selection of one of a number of possible gas flow rates. Thus for example, the

size of flame from each burner 6 when used for display may differ from that size normally occurring when the fire is used for heating.

70 CLAIMS

1. A gas appliance for simulating a solid-fuel fire, the appliance comprising simulated solid fuel, at least one burner positioned to project a flame around and over the simulated solid fuel, and means to urge a stream of air to the vicinity of the flame or flames to produce fluctuation thereof.
2. A gas appliance according to Claim 1, comprising means to guide an air stream, produced by the urging means, downwardly onto the vicinity of the flame or flames.
3. A gas appliance according to Claim 1 or Claim 2, comprising means to guide an airstream, produced by the urging means, around a burner in a direction substantially perpendicular to the direction of gas flow from the burner.
4. A gas appliance according to any one of the preceding claims, having means to illuminate the simulated solid fuel to produce the appearance of glowing solid fuel.
5. A gas appliance according to any one of the preceding claims, wherein at least one burner incorporates a flame ignition device operable in accordance with a flame-failure sensor.
6. A gas appliance for simulating a solid-fuel fire, substantially as hereinbefore described with reference to and as illustrated in the sole accompanying Figure.

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